

Claims with Markings to Show Changes Made.” Upon entry of this Amendment, claims 1 – 23¹ remain pending, with claims 1 – 5 and 21 – 23 under current examination, and claims 6 – 20 withdrawn from consideration as drawn to a nonelected invention.

In the Office Action, the Examiner withdrew the nonfinal Office Action of January 28, 2002; rejected claims 1 – 5 under 35 U.S.C. § 103(a) as unpatentable over Gotoh, et al. (U.S. Patent No. 5,650,041) in view of Chapman (U.S. Patent No. 5,976,769); and rejected claims 21 – 23 under 35 U.S.C. § 103(a) as unpatentable over Gotoh in view of Chapman and Harada, et al. (U.S. Patent No. 6,251,774B1).

Applicants appreciate the Examiner’s thorough examination of this application, especially the detailed citations which aided Applicants in reviewing the Examiner’s comments. Applicants respectfully traverse the rejections, as detailed above, for the following reasons.

Important Procedural Issues (Second Request):

The Examiner still has not acknowledged Applicants’ claim for foreign priority from Japanese Patent Application No. 11-183908 (“JP ‘908”), filed June 29, 1999, and also did not acknowledge receipt of the priority document. Applicants’ Claim for Priority and a certified copy of the priority document were filed on May 8, 2001. With the Amendment of April 26, 2002, Applicants made this same request and attached a copy of the first page of JP ‘908, along with the date-stamped postcard thereto, to corroborate that the certified copy of the priority document was indeed filed. Applicants therefore again request that the Examiner acknowledge that certified copies of the priority documents have been received. As a courtesy to the Examiner, Applicants attach another copy of the first page of JP ‘908, along with the date-stamped postcard thereto to again corroborate the filing of the priority document.

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Regarding the Amendments to Claims 1 and 21:

Applicants amend claims 1 and 21 to more appropriately define the invention.

Applicants submit that the amendments contain no new matter, in accordance with the requirements of 37 C.F.R. § 1.121(f).

Applicants also direct the Examiner to the specification at page 13, lines 7 – 24, as an exemplary section that demonstrates support for amended language of claims 1 and 21.

Applicants respectfully remind the Examiner that “[a]mendments to an application which are supported in the original description are NOT new matter.” M.P.E.P. § 2163.07, 8th Ed., Aug. 2001, p. 2100-172, emphasis in original.

Applicants submit that these amendments should render the application in condition for allowance after consideration of the remarks that follow, and should not place any burden on the Examiner insofar as raising new issues or requiring further searches of the art for him to reconsider this claim, as amended.

Regarding the Rejections of Claims 1 – 5 and 21 – 23 under 35 U.S.C. § 103(a):

Applicants respectfully traverse the rejections of claims 1 – 5 and 21 – 23, as detailed above, for the following reasons. Applicants respectfully disagree with the Examiner’s arguments and conclusions, and submit that a *prima facie* case of obviousness has not been established.

In order to establish a *prima facie* case of obviousness, three basic criteria must be met. First, the prior art reference (or references when combined) must teach or suggest all the claim elements. Second, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify a

reference or to combine reference teachings. Third, there must be a reasonable expectation of success. *See* M.P.E.P. § 2143, pp. 2100-122 – 127.

The Examiner does not show that all the elements of Applicants' claims are met in the cited references, taken alone or in combination, does not show that there is any suggestion or motivation to modify the cited references to result in the claimed invention, and does not show there would be any reasonable expectation of success from so doing.

Applicants' independent claims 1 and 21 each recite a combination of elements, including, *inter alia*, "forming a soluble thin film by distributing and baking a coating solution on a film to be processed which is formed on a semiconductor substrate, wherein the soluble thin film is soluble in a dissolving liquid..." Gotoh, Chapman, and Harada, taken alone or in combination, do not teach or suggest at least these elements of Applicants' independent claims 1 and 21.

To explain how Applicants' claimed invention is distinguishable from Gotoh, Chapman, and Harada, Applicants raise the following points. First, regarding Gotoh, the Examiner admitted that Gotoh does not teach or suggest all the elements of Applicants' claimed invention:

"Gotoh et al. fail to teach forming a soluble thin film which is soluble in a dissolving liquid on a film to be processed which is formed on the semiconductor substrate, wherein said soluble thin film comprises titanium nitride; and dissolving an etched soluble thin film in the dissolving liquid, thereby lifting off the mask pattern from the film to be processed" (Office Action, pages 2 – 3).

Second, Applicants submit that Chapman fails to teach or suggest the elements of Applicants' independent claims 1 and 21 quoted above. While Chapman does teach dissolving "TiN layer 917-918 in a solution such as SCl (1 part 29% NH₄OH, 1 part 30% H₂O₂, and 6 parts H₂O)" (column 6, lines 29 – 30), Chapman also teaches that the TiN intermediate layer portions are formed by deposition ("TiN deposition may be by sputtering Ti in a N₂ plasma or sputtering

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TiN" (column 5, lines 23 – 25)). This is clearly different from at least Applicants' claimed "forming a soluble thin film by distributing and baking a coating solution on a film to be processed which is formed on a semiconductor substrate, wherein the soluble thin film is soluble in a dissolving liquid..." (claims 1 and 21).

Third, Applicants submit that Harada fails to teach or suggest the elements of Applicants' independent claims 1 and 21 quoted above. Harada teaches a different semiconductor layer structure, and different photolithography steps, as evidence by the description in column 5, lines 10 – 55. This too is clearly different from at least Applicants' claimed "forming a soluble thin film by distributing and baking a coating solution on a film to be processed which is formed on a semiconductor substrate, wherein the soluble thin film is soluble in a dissolving liquid..." (claims 1 and 21).

This clearly demonstrates how Gotoh, Chapman, and Harada are different from the present invention.

Even though Gotoh, Chapman, and Harada do not teach or suggest all the features of Applicants' claimed invention taken separately, the Examiner's application of the references in combination does not render the recitations of Applicants' claims obvious. The cited references, taken alone or in combination, do not establish that there would have been the requisite suggestion or motivation in either reference to modify them to teach or suggest Applicants' claimed invention.

Moreover, while the Examiner alleged "it would have been obvious ... to combine the teachings of Gotoh et al. and Chapman..." (Office Action, pages 3 and 4), and "it would have been obvious to ... form an antireflection film and performing the etching steps as taught by Harada..." (Office Action, page 5), still does not address the deficiencies common to Gotoh,

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Chapman, and Harada, to allow them to teach or suggest the recitations of Applicants' invention. Since these references, taken alone or in combination, do not teach or suggest at least the above-mentioned elements of Applicants' independent claims 1 and 21, the Examiner's application of Gotoh, Chapman, and Harada as references does not serve to satisfy the tenants of a 35 U.S.C. § 103(a) rejection. The Examiner has therefore not met an essential criteria for establishing a *prima facie* case of obviousness, wherein "the prior art reference (or references when combined) must teach or suggest all the claim limitations." See M.P.E.P. §§ 2142, 2143, and 2143.03.

Furthermore, there is no suggestion or motivation to modify Gotoh, Chapman, and Harada to produce Applicants' claimed invention. Even the Examiner's characterization of the references still does not establish that there would have been the requisite suggestion or motivation to modify them. "The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination." M.P.E.P. § 2143.01, p. 2100-124, citing *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990).

As mentioned above, Gotoh, Chapman, and Harada's inventions all differ from Applicants' claimed invention. In part, because there are elements of Applicants' claims lacking in all three references, there can be no motivation in Gotoh, Chapman, and Harada to modify them to produce Applicants' claimed invention, essentially because each reference touts the benefits of different resist layers and photolithography steps. Similarly, there cannot be any expectation of success derived from the combination of these references, because combining the references still would not produce Applicants' claimed invention. One skilled in the art would only arrive at the present claimed invention by consulting Applicants' disclosure. Therefore, the only way to construct the claimed invention from the cited references would be to rely on aspects

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related to the present invention. Such reliance, however, would constitute improper hindsight reasoning.

Since Applicants have already established that the applied references do not teach or suggest all the elements of Applicants' independent claims 1 and 21, that they cannot be modified to produce the present invention, and that there would be no reasonable expectation of success derived from so combining, Applicants submit that, according to the M.P.E.P., the Examiner's citation of Gotoh, Chapman, and Harada is not sufficient to establish *prima facie* obviousness over either of Applicants' independent claims 1 or 21.

Finally, regarding dependent claims 2 – 5, 22, and 23,

“Examiners are reminded that a dependent claim is directed to a combination including everything recited in the base claim and what is recited in the dependent claim. It is this combination that must be compared with the prior art, exactly as if it were present as one independent claim.” M.P.E.P.

§ 608.01(n)(III), p. 600-77. “If an independent claim is nonobvious under 35 U.S.C. § 103, then any claim depending therefrom is nonobvious.” M.P.E.P. § 2143.03, p. 2100-26.

Therefore, Applicants submit that independent claims 1 and 21 are allowable, for the reasons argued above. In addition, dependent claims 2 – 5, 22, and 23 are also allowable at least by virtue of their respective dependency from allowable base claims 1 or 21. Therefore, Applicants respectfully submit that the Examiner should withdraw the 35 U.S.C. § 103(a) rejection of claims 1 – 5 and withdraw the 35 U.S.C. § 103(a) rejection of claims 21 – 23.

Conclusion:

In making various references to the specification set forth herein, it is understood that Applicants are in no way intending to limit the scope of the claims to the exemplary embodiments described in the specification and illustrated in the drawings. Rather, Applicants

expressly affirm that they are entitled to have the claims interpreted broadly, to the maximum extent permitted by statute, regulation, and applicable case law.

In view of the foregoing, Applicants request the Examiner's reconsideration of the application and submit that the rejections detailed above should be withdrawn. For the reasons articulated herein, Applicants submit that independent claims 1 and 21 are allowable, for the reasons already argued above. In addition, dependent claims 2 – 5, 22, and 23 are also allowable at least by virtue of their respective dependencies from allowable base claims 1 and 21. Applicants therefore request the Examiner's reconsideration of the application, and the timely allowance of the pending claims.

Should the Examiner continue to dispute the patentability of the claims after consideration of this Request, Applicants encourage the Examiner to contact Applicants' undersigned representative by telephone to discuss any remaining issues or to resolve any misunderstandings.

Please grant any extensions of time under 37 C.F.R. § 1.136 required in entering this response. If there are any fees due under 37 C.F.R. § 1.16 or 1.17, which are not enclosed, including any fees required for an extension of time under 37 C.F.R. § 1.136, please charge such fees to our deposit account 06-0916.

Respectfully submitted,

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Dated: April 18, 2003

By: 

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APPENDIX TO AMENDMENT OF April 18, 2003

Version of Claims with Markings to Show Changes Made

AMENDMENTS TO THE CLAIMS:

Please amend claims 1 and 21 as follows:

1. (Amended) A method of manufacturing a semiconductor device, comprising the steps of:

forming a soluble thin film by distributing and baking a coating solution [which is soluble in a dissolving liquid] on a film to be processed which is formed on a semiconductor substrate, wherein the soluble thin film is soluble in a dissolving liquid;

forming a mask layer on the soluble thin film;

forming a resist pattern on the mask layer;

etching the mask layer using the resist pattern as a mask to form a mask pattern;

etching the soluble thin film and the film to be processed using the mask pattern as at least a portion of a mask; and

dissolving the etched soluble thin film in the dissolving liquid, thereby lifting off the mask pattern from the film to be processed.

21. (Amended) A method of manufacturing a semiconductor device, comprising:

forming a soluble thin film by distributing and baking a coating solution [which is soluble in a dissolving liquid] on a film to be processed which is formed on a semiconductor substrate, wherein the soluble thin film is soluble in a dissolving liquid;

forming a mask layer on the soluble thin film;
forming an antireflection film on the mask layer;
forming a resist pattern on the antireflection film;
etching the antireflection film and the mask layer using the resist pattern as a mask to
form a mask pattern;
etching the soluble thin film and the film to be processed using the mask pattern as at
least a portion of a mask; and
dissolving the etched soluble thin film in the dissolving liquid, thereby lifting off the
mask pattern from the film to be processed.

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